



FINAL REPORT

**Assessment of
Geology, Energy, and Minerals (GEM)
Resources**

**BIG JACKS CREEK
GEM RESOURCE AREA**

(ID-010-09)

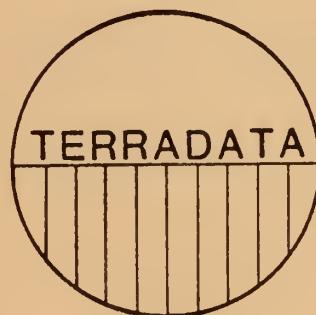
OWYHEE COUNTY, IDAHO

Prepared for

United States Department of the Interior
United States Bureau of Land Management
Scientific Systems Development Branch

March 1983

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Assessment of
Geology, Energy, and Minerals (GEM)
Resources

Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho

Prepared For:

United States Department of the Interior
United States Bureau of Land Management
Scientific Systems Development Branch

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This report was prepared as part of a Phase I Assessment of GEM
Resources within designated Wilderness Study Areas in Oregon, Idaho and
Nevada.

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- o Dr. Antonius Budding - Oil Shale and Tar Sands
- o Mr. Raymond Corcoran - Field Verification
- o Dr. James Firby - Paleontology
- o Mr. Ralph Mason - Coal
- o Mr. Richard Miller - Uranium and Thorium
- o Mr. Vernon Newton - Oil and Gas
- o Mr. Herbert Schlicker - Industrial Minerals and Geologic Hazards
- o Dr. Walter Youngquist - Geothermal
- o Dr. Paul Weis - Metals and Non - Metals.

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Ms. Pamela Ruhl provided clerical and editorial assistance throughout the project. Ms. Sara Mathews assisted with occurrence information and drafting. Mr. Philip R. Jones and Mr. Michael A. Becker produced all documents relating to the project using TERRADATA's word processing and document production systems.



EXECUTIVE SUMMARY

The purpose of this project is to evaluate and classify environments favorable for the occurrence of geology, energy, and minerals (GEM) resources in selected wilderness study areas (WSAs) in southeastern Oregon, southwestern Idaho, and northern Nevada. (See TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.") GEM resource environments have been rated on a scale that ranges from one to four, with one being least favorable and four being most favorable. Favorability classes two and three represent low and moderate favorability, respectively. Confidence levels range from A to D with A being low confidence and D being high confidence. The confidence levels are directly related to the quantity and quality of the information available for the determination of the favorability classes.

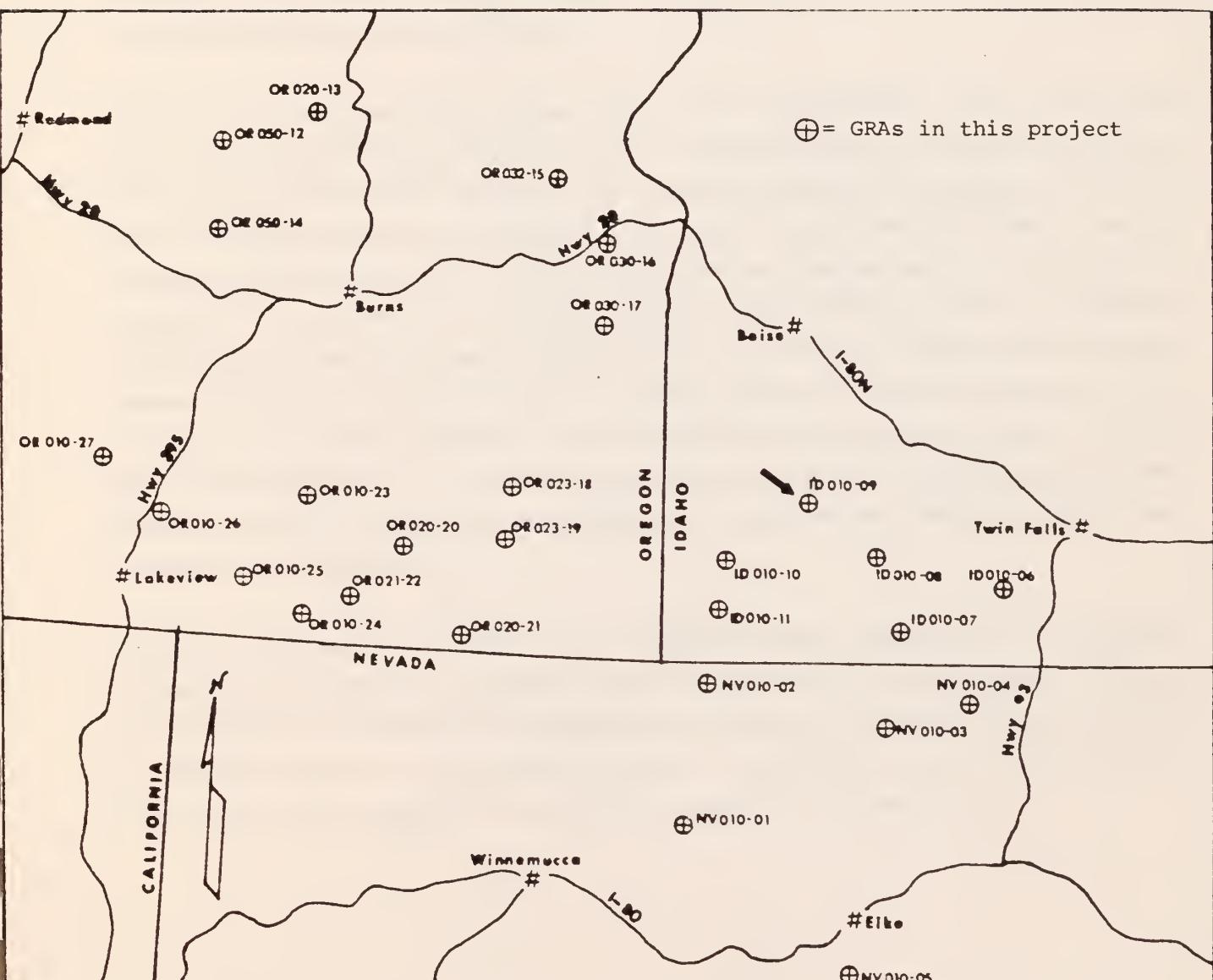
The specific area with which this report deals is the Big Jacks Creek GRA (GRA number ID - 01 - 09) which is located in southwestern Idaho near the Oregon-Idaho State line (see attached location map). The GRA contains about 612 square miles within Townships 7S and 11S and Ranges 1E through 4E. It contains three WSAs that have a combined area of 122,878 acres. These are WSA 111-6 (58,040 acres), WSA 111-7C (54,833 acres), and WSA 111-7B (10,005 acres). The study area is in the Bruneau Resource Area of the Boise BLM District.

The GRA is within the Owyhee Upland sub-province of the Columbia Intermontane physiographic province. Rocks exposed in the GRA are all Cretaceous or younger intrusives, volcanic flows, domes, and related volcaniclastic sedimentary strata. Limited exposures of Miocene lacustrine units also occur within the GRA. A caldera that is 20 to 25 miles in diameter is a major structural element located several miles northwest of the GRA. The area is located on or near the axis of the Devonian Antler orogenic belt. Basin and Range block faulting is not apparent in the area because of the thick mantle of Tertiary and Quaternary volcanics. The Big Jacks Creek GRA is not near any known mineral belts or mining districts. Historically, the area has had no significant production of any GEM resources.

The geologic environments and inferred geologic processes indicate low favorability for the accumulation of most GEM resources. The nature of the data available and the geometry of potential geologic environments do not permit subdivision of the GRA into commodity specific areas of favorability, except for geothermal resources.



GRA Location Map





The Big Jacks Creek GRA contains one geologic environment that is moderately favorable for the occurrence of diatomite resources. The entire GRA is classified 3A for potential diatomite resources in accordance with the BLM classification scheme. The geologic environment, the inferred geologic processes, and known occurrences indicate moderate favorability for the occurrence of this resource. Diatomite occurs five miles northwest of the GRA, but is not known to exist within the GRA. Hence, the low confidence level (A) of this classification.

The area has low favorability (Class 2) for metals, geothermal, coal, oil and gas, bentonite, and paleontological resources. The confidence levels of the classifications for most of these commodities are low (A or B) denoting insufficient available data and a lack of reported mineral occurrences. The area is least favorable (Class 1) for all remaining GEM resources (see GEM Classification and Confidence Level Table below). Evaluation of environments for uranium and thorium, oil shale and tar sands, limestone, and clinoptilolite resources have varying degrees of confidence. In general, environments essential for the accumulation of these resources do not exist within the study area. The oil shale and tar sands, limestone, and clinoptilolite evaluations are based on minimal direct evidence (Level C). The uranium and thorium unfavorable classification has a low confidence level (A), signifying that insufficient or only minimal indirect evidence was available for the evaluation.

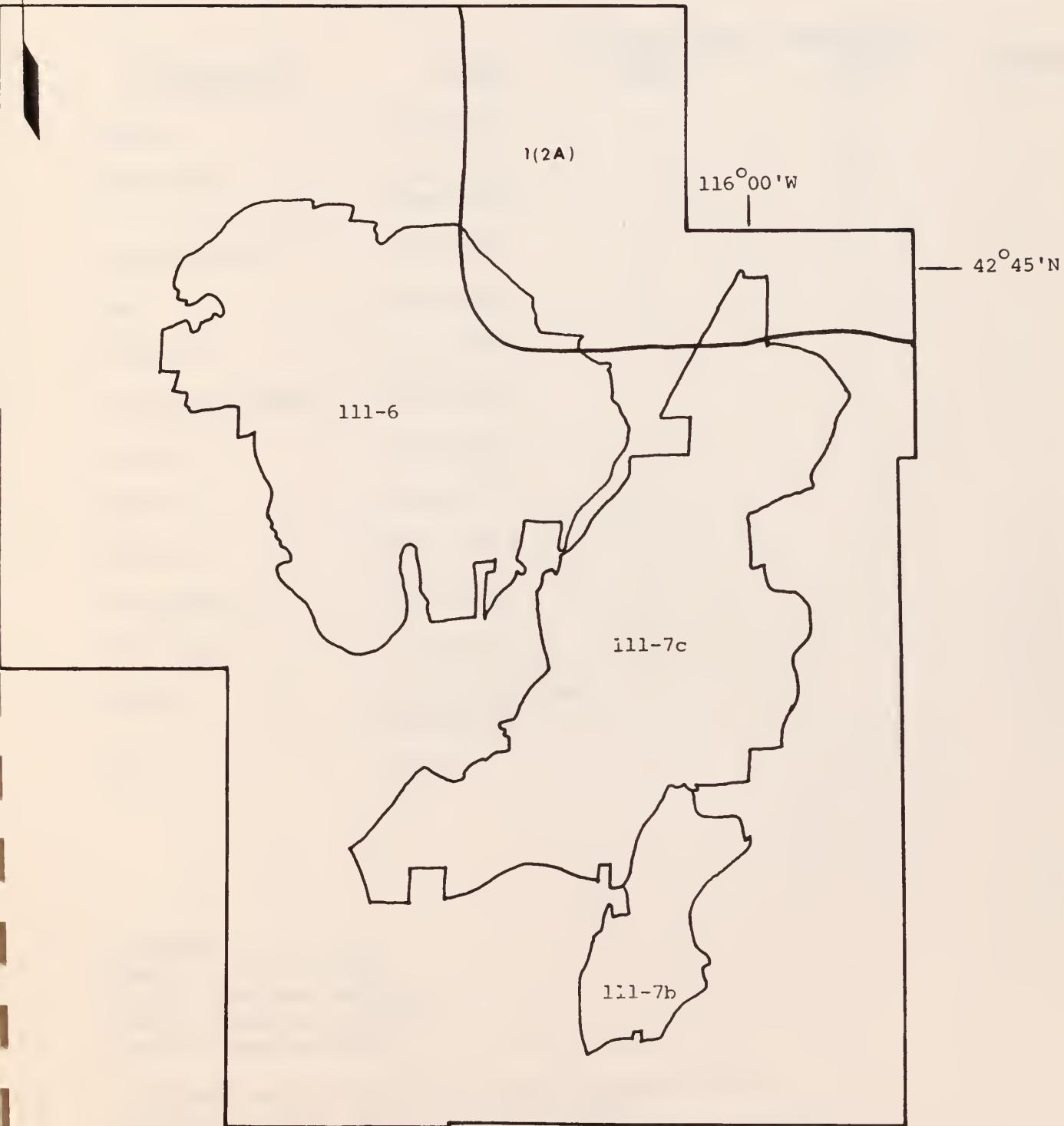
Further surface geologic investigations, including detailed mapping and stratigraphic studies, could enhance the confidence levels of many of the classifications in the Big Jacks Creek GRA. Sub-surface investigations are probably not warranted in this area due to the costly nature of the available methods. Geophysical and geochemical surveys might provide some insight into the potential resources in the study area.





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Land Classification Map
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho



Scale 1:250,000
Jordan Valley and Twin Falls 1°x2° NTMS Quadrangles

**Classification Of Lands Within The
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho
For GEM Resource Potential**

<u>COMMODITY</u>	<u>AREA</u>	<u>CLASSIFICATION LEVEL</u>	<u>CONFIDENCE LEVEL</u>	<u>REMARKS</u>
Metals	Entire GRA	2	C	
Geothermal	Area 1-2A	2	A	
	Rest of GRA	1	B	
Uranium/Thorium	Entire GRA	1	A	
Coal	Entire GRA	2	B	
Oil and Gas	Entire GRA	2	A	
Tar Sands/Oil Shale	Entire GRA	1	C	
Limestone	Entire GRA	1	C	
Bentonite	Entire GRA	2	A	
Diatomite	Entire GRA	3	A	
Clinoptilolite	Entire GRA	1	C	
Paleontology	Entire GRA	2	B	
Hazards	See Hazards Map (GRA File)			
ESLs	None	1	C	

LEGEND:

- Class 1 - Least Favorable
- Class 2 - Low Favorability
- Class 3 - Moderate Favorability
- Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
 Confidence Level B - Indirect evidence available
 Confidence Level C - Direct evidence but quantitatively minimal
 Confidence Level D - Abundant direct and indirect evidence



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1. INTRODUCTION

This report is one of 27 GRA technical reports that summarize the results of a Phase 1 assessment of the geology, energy, and minerals (GEM) resources in selected portions of southeastern Oregon, southwestern Idaho, and northern Nevada. The study region was subdivided into 27 GEM resource areas (GRAs), principally for ease of data management and interpretation. The assessment of GEM resources for this project consisted of an interpretation of existing literature and information by experts knowledgeable in both the geographic area and specific commodities. A restricted field verification program also was conducted. It is possible that the assessment would be different if detailed field exploration, geochemical sampling, and exploratory drilling programs were undertaken. (See the TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources.")

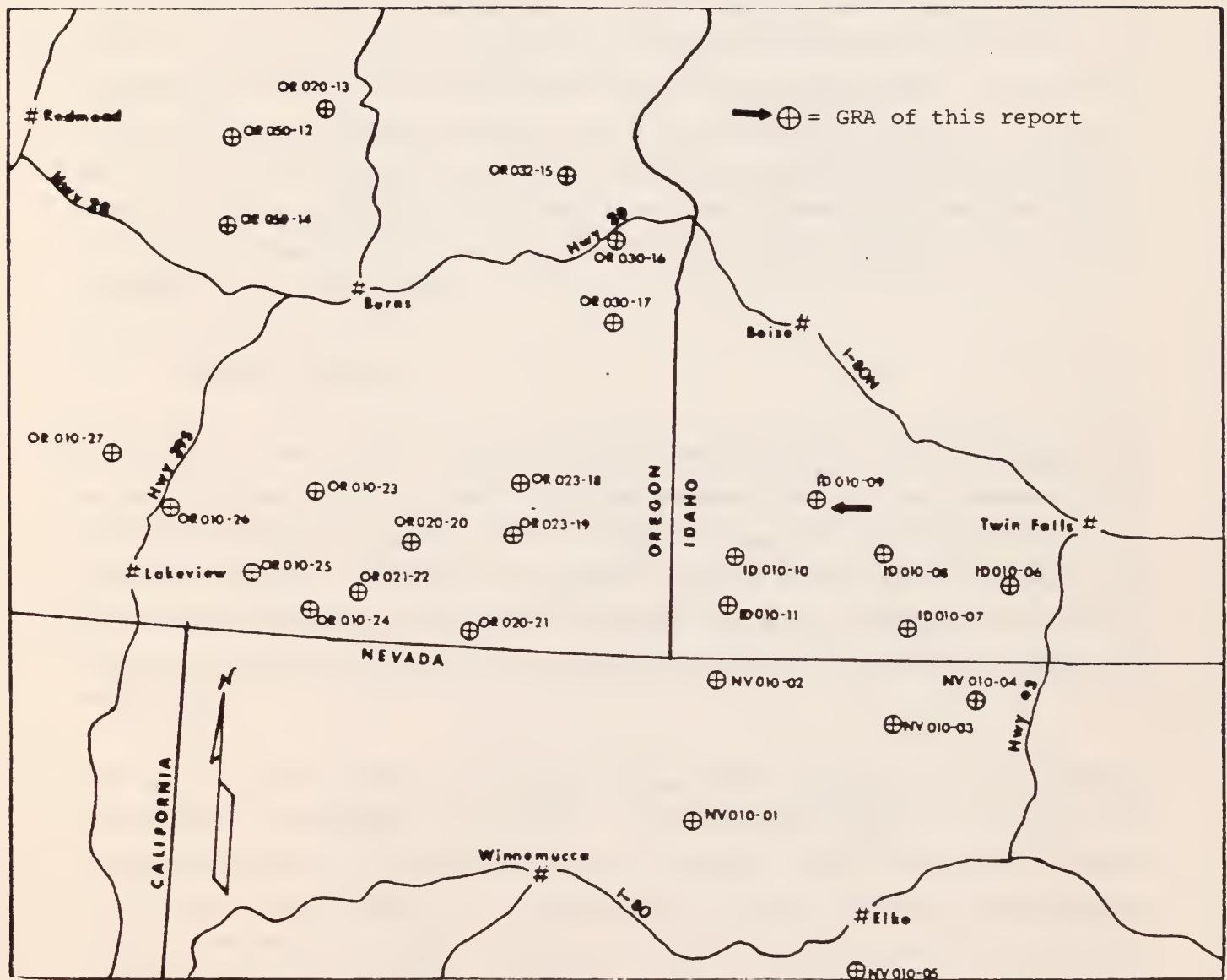
This report summarizes the assessment of the GEM resources potential of the Big Jacks Creek GRA (ID-010-09). See Figure 1-1. Commodity categories for which this GRA was evaluated are:

- o Metals
- o Oil and Gas
- o Oil Shale and Tar Sands
- o Geothermal
- o Uranium and Thorium
- o Coal
- o Industrial Minerals
- o Paleontological Resources
- o Geologic Hazards
- o Educational and Scientific Localities (ESLs)

Geologic environments within the Big Jacks Creek GRA have been rated with respect to their favorability for the occurrence of these different commodities. The favorability rating scale ranges from one to four, with one being least favorable and four being most favorable. Confidence levels in these ratings also have been assigned. These confidence levels range from A to D, with A being low confidence and D high confidence. Assigned confidence levels are related to the quantity and quality of the information available for the determination of the favorability ratings.



FIGURE 1-1
GRA Location Map



2. DESCRIPTION OF THE BIG JACKS CREEK GRA

2.1 LOCATION

The Big Jacks Creek GRA (ID - 010 - 09) is in southwest Idaho. It lies between latitudes $42^{\circ}25'N$ and $42^{\circ}50'N$ and longitudes $115^{\circ}55'W$ and $116^{\circ}23'W$. The GRA contains approximately 612 square miles within Townships 7S and 11S and Ranges 1E and 4E (see Figures 1-1 and 2-1). The area contains three Wilderness Study Areas (WSAs); WSA 111-6 (58,040 acres), WSA 111-7C (54,833 acres), and WSA 111-7B (10,005 acres). The Big Jacks Creek GRA is in the Bruneau Resource Area of the Boise BLM District. The area is about 65 miles from Boise, Idaho, which is the nearest transportation center offering a minimum of rail, highway, and/or charter-air services. Access to the contained WSAs is via county maintained dirt or packed-gravel roads. Vehicular access to the interior of the WSAs is poor to non-existent.

2.2 GENERAL GEOLOGY

The Big Jacks Creek GRA is primarily in the Jordan Valley $1^{\circ}x2^{\circ}$ NTMS quadrangle map in the southwest part of Idaho. The data available for this area includes NURE investigations^{(1,2,3,4)*}, general mineral resource information⁽⁵⁾, and limited small scale geologic mapping⁽⁶⁾. Reconnaissance geologic mapping (scale 1:62,000), magnetic and gravity maps, and geochemical data are available for areas northwest of the GRA⁽⁷⁾. Resource and geologic information for the Big Jacks Creek GRA are fair, compared with other GRAs.

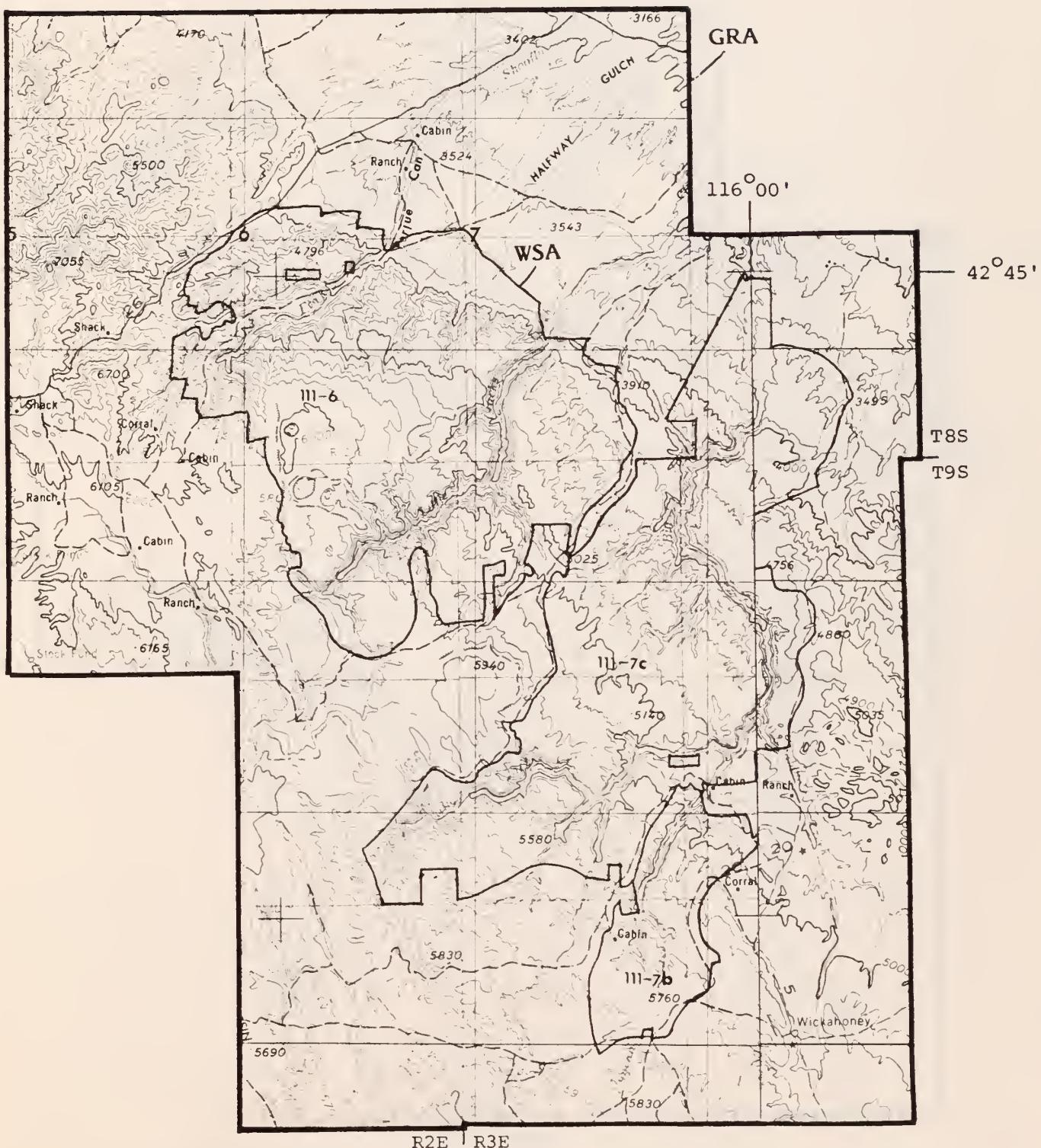
The Big Jacks Creek GRA is within the Owyhee Upland sub-province of the Columbia Intermontane physiographic province⁽⁸⁾. The Owyhee Upland is a plateau and mountainous region in northern-most Nevada, southwest Idaho, and southeast Oregon. The Owyhee Upland sub-province is separated from the Great Basin by a major drainage divide located south of the GRA in Nevada. The area is bounded on the north by the High Lava Plains (Snake River Plain) sub-province of the Columbia Intermontane province. Cretaceous granitics are the oldest rocks exposed in the GRA. The youngest rocks are Quaternary basalts and tuffaceous units (Figure 2-2).

* In this report, citations are superscripted numbers. They refer to bibliographic entries listed in Appendix A: References Cited.



FIGURE 2-1

**Topographic Map
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho**



Scale 1:250,000
(Jordan Valley and Twin Falls $1^{\circ} \times 2^{\circ}$ NTMS Quadrangles)

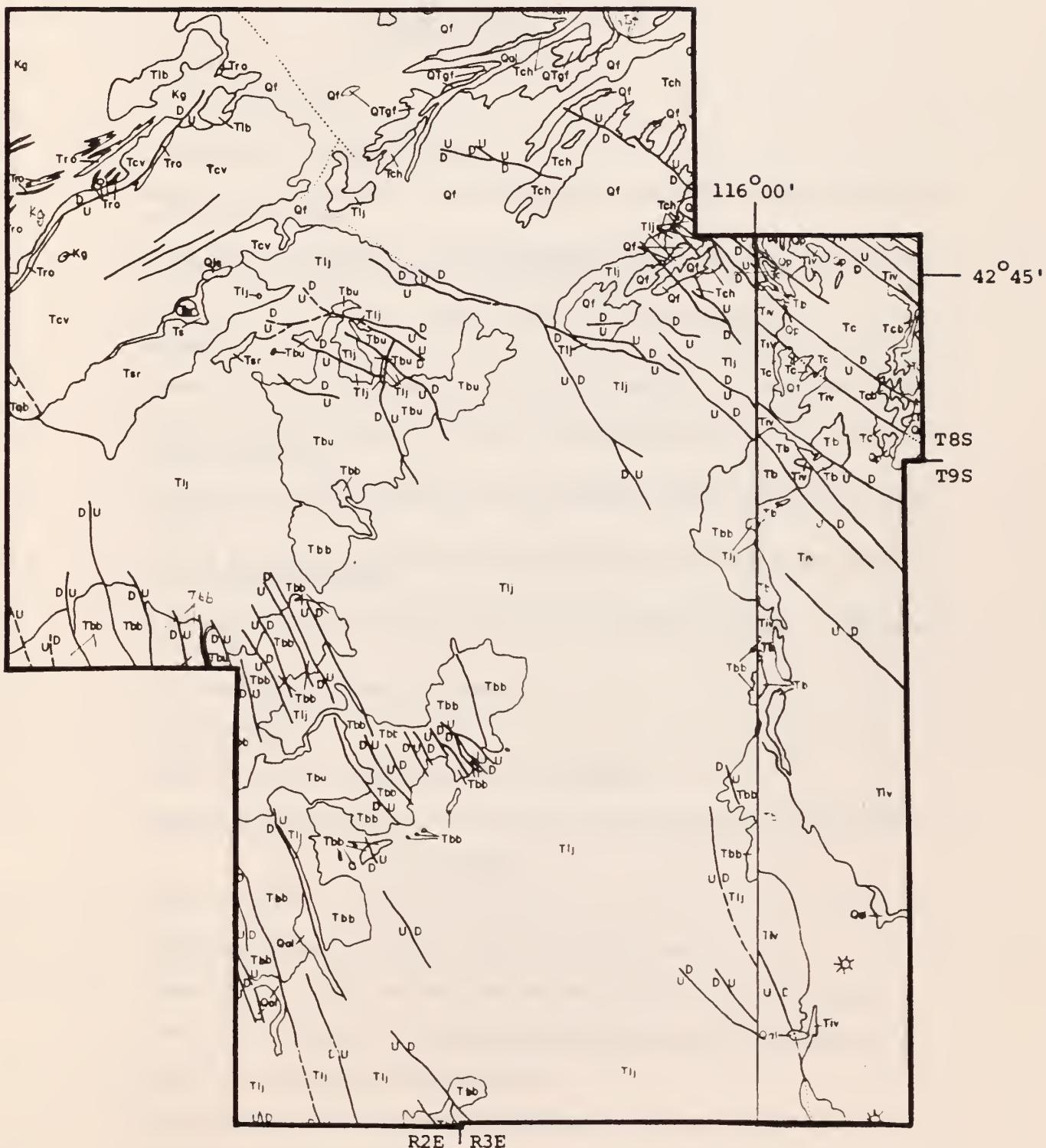
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FIGURE 2-2

**Geologic Map
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho**

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Scale 1:250,000

Jordan Valley and Twin Falls 1°x2° NTMS Quadrangles)

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FIGURE 2-2
(Continued)

**Geologic Map Legend For
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho**

**Jordan Valley
(West of 116°00')**

- Qal - Alluvium
- Qls - Landslide Deposits
- Qf - Fan Alluvium and Fanglomerate
- QTgf - Glenn's Ferry Formation: Lake and stream deposits of ash, tuffaceous sand, silt, and clay.
- Tch - Chalk Hills Formation: Lake and stream deposits of sand, silt, clay, and diatomite, with minor vitric-ash and basaltic tuff.
- Tbb - Banbury Basalt: Olivine basalt and minor interbedded stream and lake deposits.
- Tbu - Banbury Basalt: Upper basalt mesa-forming sequence of thin basalt flows.
- Tiv - Idavada Volcanics: Silicic latite; devitrified welded tuffs and minor interbedded sediments.
- Tlj - Tuff of Little Jacks Creek: Extremely densely welded, flow-layered rhyolite tuff.
- Tsr - Tuff of Swisher Ridge: Densely welded rhyolite tuff with minor vitrophyres and non-welded tuff.
- Ts - Sedimentary Rocks Beneath the Tuff of Swisher Ridge: Tuffaceous sandstone.
- Tlb - Latitie and Basalt Flows Undivided
- Tro - Rhyolite Dikes
- Tcv - Challis Volcanics: Rhyodacitic tuff and felsite.
- Kg - Granitic Rocks Undivided: Granodiorite, granite, and quartz monzonite.

**Twin Falls
(East of 116°00')**

- Qal - Stream Alluvium
- Qp - Black Mesa Gravel: Caliche-capped sand and gravel.
- Qt - Tuana Gravel: Silicic volcanic pebbles and cobbles with sand and silt.
- Tc - Chalk Hills Formation: Lake and stream deposits; silicic volcanic ash.
- Tcb - Chalk Hills Formation: Olivine Basalt.
- Tb - Banbury Basalt: Olivine basalt altered to basaltic saprolite.
-  - Fault (dashed where inferred).
-  - Geologic contact (dashed where inferred).
-  - Volcanic center.



2.2.1

Geomorphology

The Big Jacks Creek GRA encompasses 612 square miles in the Owyhee Upland sub-province of the Columbia Intermontane physiographic province. The Owyhee Upland is a relatively flat plateau that parallels the Snake River Plain and includes portions of Idaho, Oregon, and Nevada. The northern part of the Owyhee Upland includes South Mountain and the Silver City Range. These peaks have elevations in excess of 8,000 feet whereas the bulk of the surrounding basalt covered plateau stands at an elevation of about 5,500 feet.

The Big Jacks Creek GRA contains three WSAs; WSA 111-6, WSA 111-7C, and WSA 111-7B, that have a combined area of 122,878 acres. The study area is about 22 miles east of South Mountain and eight miles south of the Snake River. Perennial streams that drain the GRA include Shoofly, Little Jacks, and Big Jacks Creeks. These streams flow northeastward into the Snake River. Un-named, intermittent, first-order streams drain parts of the study area. All of the streams within Big Jacks Creek GRA exhibit a dendritic drainage pattern. In the southwestern three-fourths of the GRA, the streams are actively eroding an upland area primarily composed of the Tuff of Little Jacks Creek. The northeastern quarter of the GRA is a gently sloping pediment surface that extends to the Snake River. The two areas are separated by a prominent fault-line scarp.

Total relief in the Big Jacks Creek GRA is about 4,055 feet. Local relief along the major streams is as much as 600 feet. The highest point (7,055 feet) is near the western edge of the GRA. The lowest point (3,000 feet) is near the northeastern edge of the area.

2.2.2

Lithology and Stratigraphy

Rocks within or near the Big Jacks Creek GRA range from Paleozoic metamorphic units to the Tertiary Banbury Basalt (Figure 2-2). This discussion relies heavily upon work by Berry and others⁽²⁾ and Bennett⁽⁷⁾.

Paleozoic metamorphic rocks and Mesozoic intrusives comprise the Pre-Tertiary basement exposed in the Owyhee Mountains portion of the Owyhee Uplands sub-province. These rocks underlie the Castle Creek and South Mountain areas and the Silver City Range. Paleozoic metamorphic rocks in the Silver City Range consist of quartz-biotite schists and quartzite. Quartz-biotite schists comprise the bulk of the Paleozoic



rocks exposed in the Castle Creek area. The age of these units is not well known. Neill⁽⁹⁾ suggests that the metaquartzites represent turbidite sequences that were derived from a stable Paleozoic shelf to the east. This is consistent with Newton's⁽¹⁰⁾ depositional basin model (Figure 2-3) if the actual margin of the western Late Paleozoic is somewhat east of where it has been mapped, or if the metamorphic rocks in this area are Middle or Early Paleozoic. Pre-Cenozoic rocks in the South Mountain area compose a sequence of schists, quartzites, and marbles that are over 3,000 feet thick. These occur as roof pendants and xenoliths in Late Mesozoic and Cenozoic intrusive masses. Intrusives in the South Mountain area include gray, locally gneissic, biotite-hornblende-quartz diorite and granodiorite⁽¹¹⁾. Aplite and pegmatite dikes and a large mass of hornblende gabbro also are exposed. Intrusives in the Silver City Range are dominantly biotite granodiorite with lesser amounts of quartz monzonite, granite, and alaskite. This Paleozoic assemblage is not exposed in the Big Jacks Creek GRA; however, similar rocks may occur at depth beneath the Tertiary cover. Cretaceous granodiorites, diorites, and quartz monzonites occur in the northwestern part of the GRA. These intrusives are unconformably overlain by the Challis Volcanics. The Challis Volcanics are the oldest Tertiary rocks in the Owyhee Upland, they consist of compound cooling units of densely welded rhyodacitic tuff up to 1,000 feet thick.

The bulk of the rocks in the Owyhee Upland resulted from bimodal rhyolite-basalt Miocene volcanism. In the Idaho and Oregon portions of the Owyhee Upland, the Miocene volcanics are divided into three major sequences: a lower basalt sequence, a middle silicic sequence, and an upper basalt sequence. The lower basalt sequence consists of latite and alkaline olivine basalt flows whose aggregate thickness is up to several thousand feet. The latite and basalt occur as thin, vesicular, interbedded flows that, in places, unconformably overlie the Pre-Tertiary basement. This lower basaltic unit is the same age as the Columbia River basalt group; however, it is much more alkaline than the Columbia River basalt group.

The middle silicic sequence, also known as the Idavada Volcanics⁽⁷⁾, composes a large volume of ash-flow tuffs and ignimbritic units that underlie most of the Owyhee Upland. Oldest of these is the Silver City rhyolite, a compound cooling unit of remobilized, densely welded tuffs that are up to 600 feet thick. The Silver City rhyolite is followed by units from the Juniper Mountain volcanic center that include the Tuff of Swisher Ridge, the Badland Tuff, and interbedded tuffaceous sandstones and siltstones. Younger Miocene silicic flows in the Owyhee Upland include flow-layered and flow-banded rhyolites and tuffs of Duck Valley, Black Mountain, Browns Creek, and Little Jacks Creek.



The upper basalt sequence comprises the wide-spread flows of the Banbury Basalt. The Banbury Basalt sequence contains many thin flows of fine-grained, vesicular, alkaline-olivine basalt and minor interbedded sedimentary units. The sedimentary units contain basalt clasts, tuffaceous sands and gravels, ash beds, and local diatomite. This formation also contains alluvial and fanglomeratic sediments.

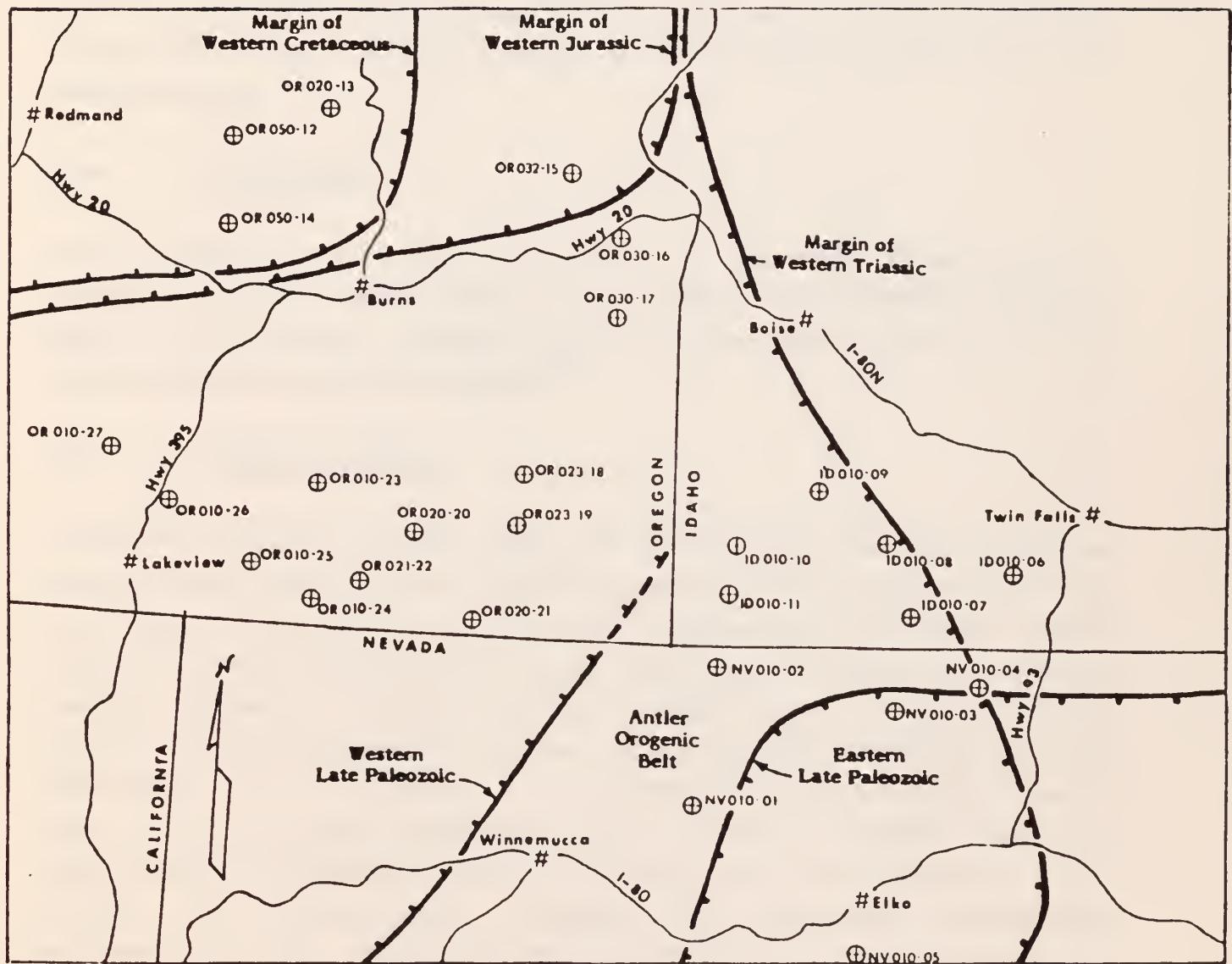
2.2.3 Structural Geology

Structural information in the Big Jacks Creek GRA is minimal due to the amount of Tertiary cover. Lineaments of Basin and Range origin have been interpreted from LANDSAT imagery and topographic maps by Schlicker⁽¹²⁾ specifically for this project. The origin of these linears and arcuates and the nature of the Pre-Tertiary basement are not well known. Bennett⁽⁷⁾ has postulated the occurrence of a major caldera west of the study area. Cretaceous intrusive bodies that have associated mineralization occur at a considerable distance to the northwest in Idaho, and south of the area, in Nevada.

Paleozoic metasedimentary rocks northwest of the GRA present an enigma. If the northeast trending Antler orogenic belt extends to the margin of the Idaho Batholith, then virtually all of the Owyhee Upland would have been above sea-level during the Late Paleozoic⁽¹⁰⁾. Therefore, the Paleozoic units of undetermined age that occur near South Mountain would have to be Early Paleozoic. Conversely, if the Antler orogenic belt takes a more easterly trend in southern Idaho, it is conceivable that these units could be part of the western Late Paleozoic assemblage. The estimation of the potential for oil and gas in several GRAs in the Owyhee Upland is affected, at least in part, by this problem. The presence of Late Paleozoic petroleum host rocks would enhance the oil and gas potential of the study area. Newton⁽¹⁰⁾ suggests that the area was affected by the Antler and subsequent Sonoma orogenies, and is void of Late Paleozoic units. By Late Devonian time, the Antler Orogeny developed along a north-northeast trending swath through northwest Elko County, Nevada, and on into southwestern Idaho. The Big Jacks Creek GRA may lie near the axis of the Antler orogenic belt. As a direct result of the Antler orogenic event, a Pennsylvanian clastic wedge developed along the margins of the uplift. The orogeny culminated in a period of extensive thrust faulting that includes the Roberts' Mountain thrust south of the GRA.



FIGURE 2-3
Paleogeographic Map⁽¹⁰⁾
Oregon-Idaho-Nevada
Tri-State Area



The Sonoma Orogeny occurred during the Permian in north-central Nevada⁽¹⁰⁾. This deformational episode included more thrust faulting, which further complicates the interpretation of the structural geology of this area.

A tremendous increase in volcanic activity occurred in the tri-state area during the Late Cenozoic. This is recorded by the large volume of Tertiary extrusives that blanket the area. The most prominent structural feature in the GRA is a series of northwest-trending normal faults. The downdropped sides of the majority of the faults are toward the Snake River basin. These faults probably occurred in response to downwarping of the Snake River basin.

2.2.4 Paleontology

The paleontology of the Big Jacks Creek GRA is not well known because the area is covered primarily by welded rhyolite tuffs or other non-fossiliferous lithologies. Miocene fossil assemblages, including mammals, fish, shellfish, and plants may occur within restricted lacustrine environments⁽¹³⁾.

2.2.5 Historical Geology

Pre-Tertiary basement rocks that occur near the Big Jacks Creek GRA consist of Paleozoic metamorphic rocks and Mesozoic intrusives. They are exposed in the Silver City Range, at South Mountain and in the Castle Creek areas of the Owyhee Uplands. Paleozoic structural evolution of the Owyhee Upland is not well known. There are no contiguous exposures of definitive Paleozoic lithologies due to the overlying Tertiary deposits. Therefore, the position of the Owyhee Upland relative to the Paleozoic Antler orogenic belt is not fully understood. A few exposures of Paleozoic turbidite sequences suggest that the Owyhee Upland area was part of the Late Paleozoic eugeoclinal depositional basin (Figure 2-3). Mesozoic intrusive activity has affected parts of the province. This intrusive activity is associated with minor metallic mineralization northwest of the GRA. Intrusives in the South Mountain area have radiometric ages between 87 million years⁽¹⁴⁾ and 45.2 million years⁽¹¹⁾.

The oldest Tertiary rocks in the province are the Eocene Challis Volcanics. They form an extensive sequence in the vicinity of Poison and Castle Creeks. The Challis Volcanics have been dated at 43.6 million years⁽⁹⁾.



During Miocene time the Owyhee Upland sub-province was subjected to Basin and Range-type extensional faulting that was accompanied by bimodal rhyolite-basalt volcanism. The Miocene bimodal volcanic rocks form the bulk of the rocks in the Owyhee Upland. In Idaho, they are divided into three subunits; an older basaltic sequence, a middle unit composed of silicic flows and tuffs, and a younger basaltic sequence that is equivalent to the rocks in the adjacent Snake River Plain⁽²⁾.

2.3 ENVIRONMENTS FAVORABLE FOR GEM RESOURCES

The Big Jacks Creek GRA contains one environment that is moderately favorable for potential diatomite resources⁽¹²⁾. Diatomite beds occur five miles northwest of the area. The environment favorable for the formation of diatomite deposits occurs within the Banbury Basalt and the Chalk Hills Formation. Periods of volcanic quiescence during the Tertiary permitted lakes to form on the surface of the relatively flat-lying Banbury Basalt. These lakes provided the environment necessary for diatoms to flourish and form taphogenic accumulations of their siliceous tests. The size of the potential deposits is primarily dependent on two factors; the duration of the period of quiescence, and the lateral extent of the favorable lacustrine environment. Whereas diatomite deposits occur as interbeds at differing stratigraphic intervals within the basalts, it is impossible to predict the spatial distribution of potential deposits except where they are exposed. The probability of the occurrence of unknown diatomite deposits anywhere within the GRA is excellent. The depositional model does not, however, allow the prediction of the precise location of such deposits.

The Big Jacks Creek GRA has a low favorability (Class 2) for the occurrence of environments favorable for metals, geothermal, coal, oil and gas, bentonite, and paleontological resources. The area contains no environments that exhibit favorable characteristics for other GEM resources.

2.3.1 Environments for Metals Resources

Portions of WSA 111-6 and WSA 111-7C contain geologic features that indicate a possibility of metallic mineral deposits. The Cretaceous intrusives in the northwestern part of the Big Jacks Creek GRA represent supportive recognition criteria. These intrusives, paired with nearby areas of intense faulting, provide sites for mineralization that are analogous to those found in Oregon and Nevada⁽¹⁶⁾. Zones of hydrothermal alteration or bleaching are not present in the Big Jacks Creek GRA.



2.3.2 Environments for Oil and Gas Resources

The Big Jacks Creek GRA has a low favorability for the occurrence of oil and gas resources. Only a small portion of the northern part of the GRA currently is leased or under application for oil and gas leases. The area is within the boundaries of Miocene Lake Bruneau. There is no direct evidence, however, that the GRA is favorable for potential oil and gas resources⁽¹⁰⁾. Favorable Late Paleozoic and Mesozoic environments probably do not exist in the area. There are no exploratory wells in this area.

2.3.3 Environments for Oil Shale and Tar Sands Resources

The Big Jacks Creek GRA contains no environments favorable for the occurrence of oil shale or oil impregnated sands⁽¹⁷⁾. The area is underlain predominantly by Tertiary volcanics of felsic to ferromagnesian composition. Potential host rocks are largely tuffaceous and contain only minor amounts of non-volcanic clastic material. Favorable lithologies are not present.

2.3.4 Environments for Geothermal Resources

The Big Jacks Creek GRA contains one environment favorable for geothermal resources. This environment occurs along the major southern flexure of the Snake River basin. Numerous faults, hot springs, and part of the Northern Owyhee County Geothermal Resource Area occur in the northern part of the GRA⁽¹⁸⁾. Cretaceous intrusives and areas that lie away from the fault zone are not favorable.

2.3.5 Environments for Uranium and Thorium Resources

The Big Jacks Creek GRA does not contain any environments that are favorable for the occurrence of uranium or thorium deposits⁽¹⁹⁾. The GRA does not exhibit any of the lithologic, alteration, or geochemical criteria that would suggest the presence of uranium or thorium. The area is not far enough into the Snake River basin to be considered favorable.



2.3.6 Environments for Coal Resources

The Big Jacks Creek GRA contains environments that have a low favorability for the occurrence of coal and lignite deposits⁽¹⁵⁾. The chances for coal to have formed in the study area are remote. The geology of the GRA does not support the conclusion that euxinic environments favorable for the formation of coal deposits existed in the area. Much of the area either is mantled with accumulations of lavas and related volcanic products or has been modified by adjacent volcanic activity. There is a chance that Miocene lacustrine strata could contain limited amounts of thin, low-grade lignites.

2.3.7 Environments for Industrial Minerals Resources

Volcanic rocks in the Big Jacks Creek GRA may contain environments favorable for the development of bentonite as an alteration product of felsic flows and tuffs. There is no direct evidence, however, that the felsic volcanics in this area have been altered in this manner⁽¹²⁾.

As discussed in Section 2.3, above, diatomite occurs five miles north of the GRA. All of the WSAs in this GRA are underlain, at least in part, by potential diatomite-bearing rocks.

2.3.8 Environments for Paleontological Resources

Environments that are potentially favorable for the occurrence of fossiliferous strata are limited because the majority of the Big Jacks Creek GRA is characterized by non-fossiliferous lithologies. No fossil localities or other direct or inferred evidence that indicates favorability exist in the study area⁽¹³⁾.

2.3.9 Environments for Geologic Hazards

Potential geologic hazards in the Big Jacks Creek GRA consist of faults, landslides, and/or volcanic centers⁽¹²⁾. These features were noted from aerial photographs, geologic maps, and topographic maps. There is no historical record of violent seismic or volcanic activity in the area. The potential for mass movement exists along all over-steepened slopes within the GRA.



2.3.10

Educational and Scientific Localities

There are no known ESLs in the Big Jacks Creek GRA.



3. ENERGY AND MINERAL RESOURCES IN THE BIG JACKS CREEK GRA

The entire Big Jacks Creek GRA is moderately favorable for the occurrence of diatomite deposits. Conversely, it is unfavorable for most other GEM resources.

3.1 KNOWN DEPOSITS

The Big Jacks Creek GRA contains no known deposits of GEM resources, nor is it located in or near any known mineral belt or mining district.

3.2 OCCURRENCES

The Big Jacks Creek GRA contains no CRIB or NURE-related occurrences. It contains two MILS cluster localities; one in the northwestern part of the GRA, and one along Big Jacks Creek in Township 8S, Range 3E (Figure 3-1). The MILS locality along Big Jacks Creek presents an enigma in that it contains 28 individual records that include almost as many different (geochemically incompatible) commodities. The MILS records for the GRA are given in Appendix B of this report.

3.3 CLAIMS

The Big Jacks Creek GRA contains 174 unmining claims (Figure 3-2). Most of the claims occur in the northwestern and western parts of the GRA. They are commonly in or near Cretaceous intrusives or the Tertiary Challis Volcanics. Several placer claims are located along the East Fork of Shoofly Creek within the western edge of WSA 111-6. Claims data are current as of 15 August, 1982.

3.4 LEASES

Four townships in the northern part of the Big Jacks Creek GRA are currently leased or under lease application for oil and gas. Lease information is current as of 15 August, 1982.

3.5 DEPOSIT TYPES

There are no known deposits within the Big Jacks Creek GRA.



N

FIGURE 3-1

**MILS Localities Map
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho**

7

x = Site Keyed to Explanation

19
x

7
x

This map is an overlay for Figures 2-1 and 2-2.

Scale 1:250,000
(Jordan Valley and Twin Falls $1^{\circ} \times 2^{\circ}$ NTMS Quadrangles)

- III - 2 -

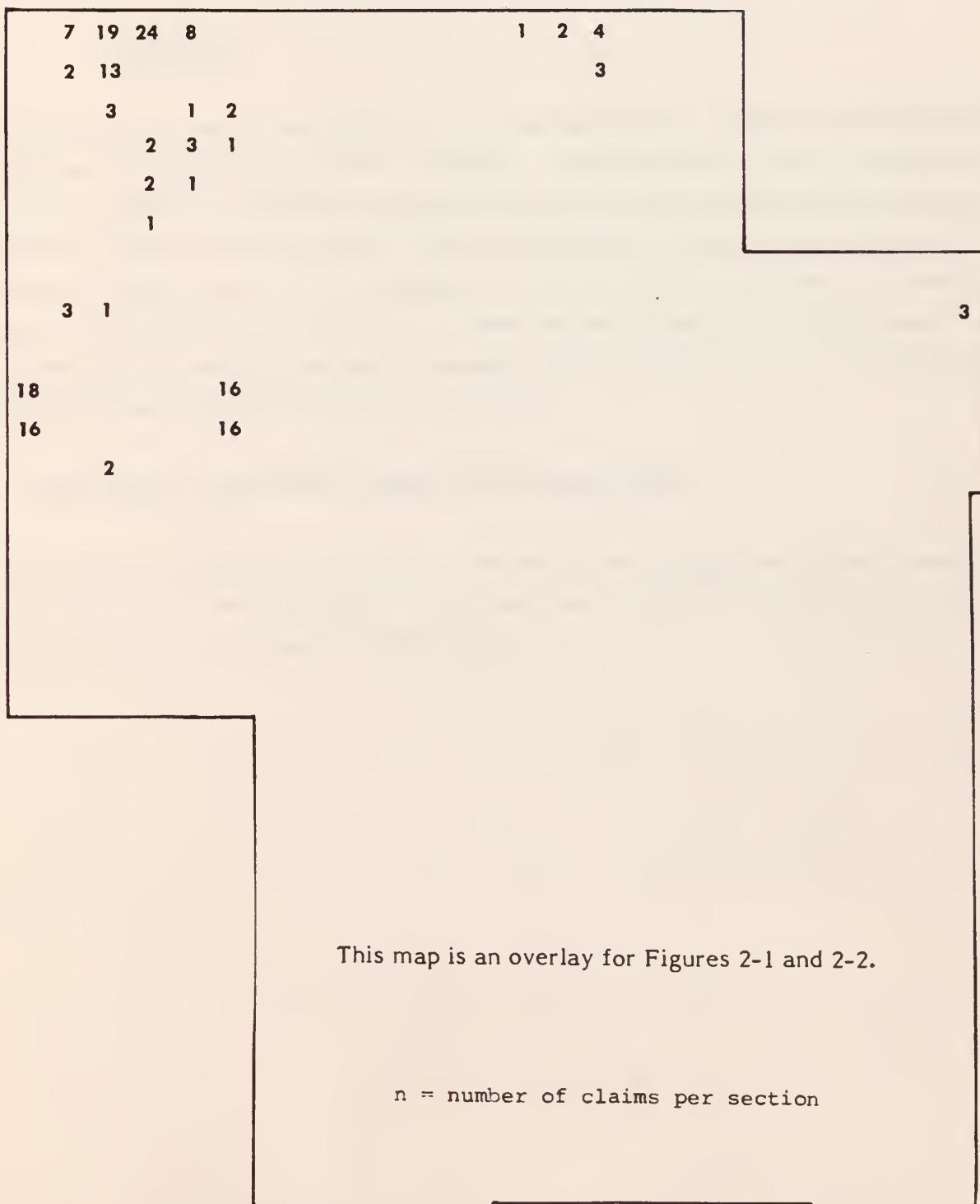
TERRADATA
San Francisco
Denver



N

FIGURE 3-2

Claims Density Map
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho



Scale 1:250,000
(Jordan Valley and Twin Falls $1^{\circ} \times 2^{\circ}$ NTMS Quadrangles)



3.6 MINERAL ECONOMICS

The Big Jacks Creek GRA is classified as being moderately favorable for the occurrence of potential diatomite resources⁽²⁰⁾.

3.6.1 Diatomite

Diatomite is used primarily as a filter-aid, as an industrial filler, and other miscellaneous applications, including insulation⁽²¹⁾. Diatomite was produced by seven companies in four states in 1981⁽²²⁾. California accounted for more than 50 percent of total diatomite production. The United States is the largest world producer and consumer of diatomite. The United States, however, is a net exporter of this commodity. Demand for diatomite is expected to increase at an annual rate of three percent through 1990. World resources of diatomite are adequate for the foreseeable future, but the need for near-market sources will encourage development of new sources.

3.7 STRATEGIC AND CRITICAL MINERALS AND METALS

The Big Jacks Creek GRA is not favorable for any of the strategic and critical minerals listed in Table 3-4 of the TERRADATA report entitled "Procedures for the Assessment of Geology, Energy, and Minerals (GEM) Resources."



4. CLASSIFICATION OF LAND FOR GEM RESOURCES POTENTIAL

The precise location of specific favorable environments within a given GRA depends upon three principal factors:

- o The precision and specificity of available data;
- o The nature (size and spatial distribution) of anticipated deposits as predicted from known models; and
- o The geometry of the favorable geologic environments.

Commodity-specific information in the Big Jacks Creek GRA is limited. Sub-surface information is virtually non-existent. Therefore, with the exception of geothermal resources, the entire area, rather than specific subareas, has been classified for individual GEM resources (Figure 4-1 and Table 4-1).

The Big Jacks Creek GRA is moderately favorable (Class 3) for potential diatomite resources because it contains the appropriate geologic environment and a nearby occurrence of the resource⁽¹²⁾. Diatomite occurs within five miles of the GRA. Similar lacustrine environments may occur as interbeds within the within the Banbury Basalt throughout the GRA. The confidence level (A) is assigned to this classification because the available data do not provide direct, irrefutable evidence for the occurrence of this commodity within the study area.

The Big Jacks Creek is has a low favorability (Class 2) for the occurrence of metallic resources⁽¹⁶⁾. The area does not exhibit geologic characteristics to warrant a higher classification. It is primarily underlain by un-mineralized Tertiary volcanogenic rocks. However, the Challis Volcanic and other lithologies associated with Cretaceous intrusives in the northwestern part of the GRA contain environments that are potentially favorable for metallic mineralization. The confidence level (C) of this evaluation signifies that the available geologic data provide minimal direct evidence to support the possible existence of metallic resources.

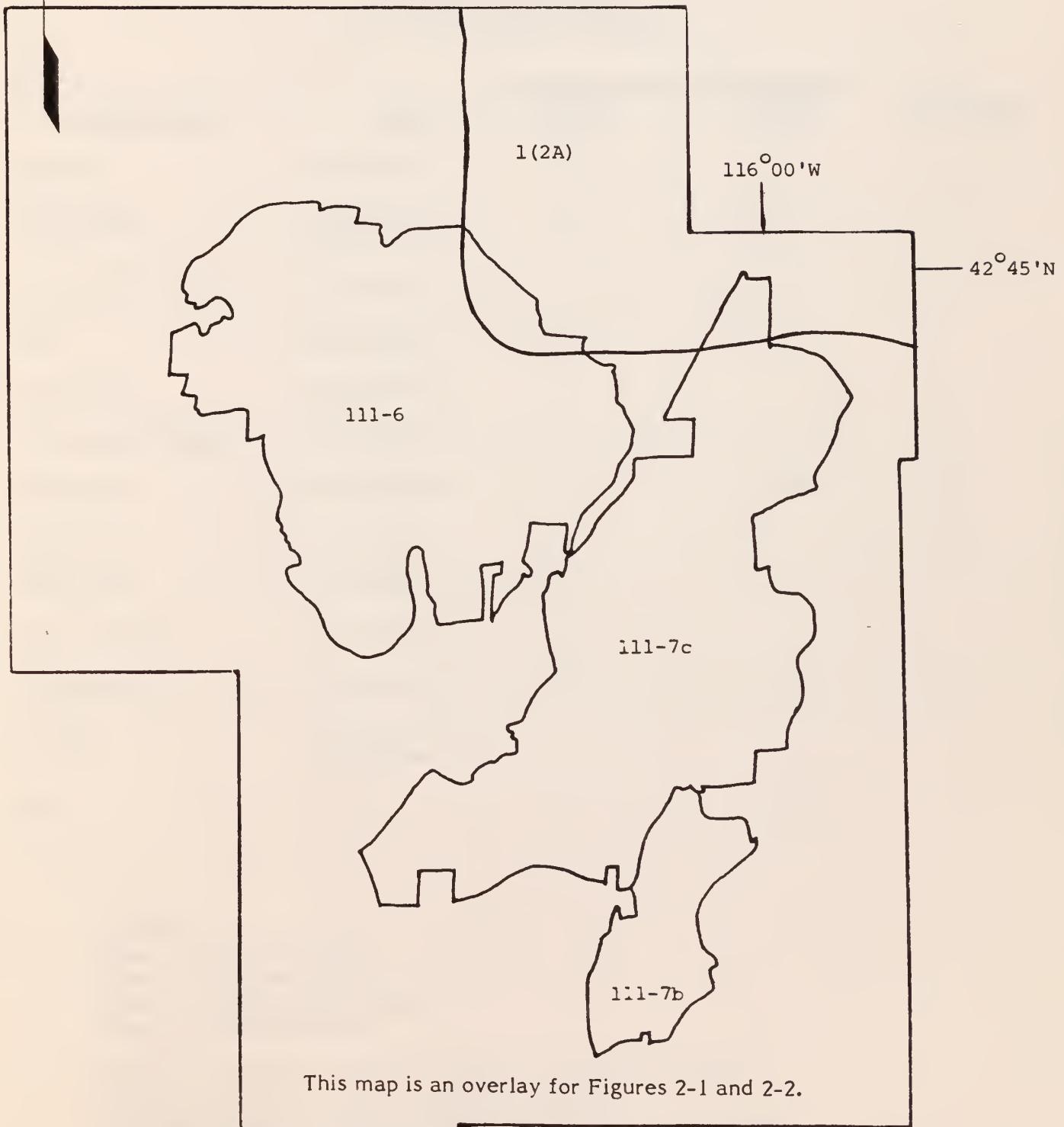
The study area has a low favorability (Class 2) for coal resources⁽¹⁵⁾. Environments favorable for the accumulation of coal deposits do not exist in the area. The geologic history of the study area does not support environments favorable for the formation of coal deposits because much of the area is mantled with and/or modified by Tertiary volcanism. Low-grade lignite occurs in Oregon, northwest of the study area, and a minor amount of coal has been mined for domestic consumption in parts of southwest Idaho. Lacustrine units within the volcanic strata may contain thin lignite beds; therefore, a low (B) confidence level is assigned.



N

FIGURE 4-1

Land Classification Map
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho



Scale 1:250,000
(Jordan Valley and Twin Falls $1^{\circ}x2^{\circ}$ NTMS Quadrangles)

- IV - 2 -

TERRADATA
San Francisco
Denver



TABLE 4-1

**Classification Of Lands Within The
Big Jacks Creek GRA
(ID - 010 - 09)
Owyhee County, Idaho
For GEM Resource Potential**

<u>COMMODITY</u>	<u>AREA</u>	<u>CLASSIFICATION LEVEL</u>	<u>CONFIDENCE LEVEL</u>	<u>REMARKS</u>
Metals	Entire GRA	2	C	
Geothermal	Area 1-2A	2	A	
	Rest of GRA	1	B	
Uranium/Thorium	Entire GRA	1	A	
Coal	Entire GRA	2	B	
Oil and Gas	Entire GRA	2	A	
Tar Sands/Oil Shale	Entire GRA	1	C	
Limestone	Entire GRA	1	C	
Bentonite	Entire GRA	2	A	
Diatomite	Entire GRA	3	A	
Clinoptilolite	Entire GRA	1	C	
Paleontology	Entire GRA	2	B	
Hazards	See Hazards Map (GRA File)			
ESLs	None	1	C	

LEGEND:

- Class 1 - Least Favorable
- Class 2 - Low Favorability
- Class 3 - Moderate Favorability
- Class 4 - High Favorability

Confidence Level A - Insufficient data or no direct evidence
 Confidence Level B - Indirect evidence available
 Confidence Level C - Direct evidence but quantitatively minimal
 Confidence Level D - Abundant direct and indirect evidence



Area 1-2A in Figure 4-1 is classified favorable (Class 2) for potential geothermal resources because it includes part of a designated geothermal resource area and numerous hot springs. The confidence level (A) is low because limited temperature information does not indicate substantial reservoir temperatures⁽¹⁸⁾.

The entire Big Jacks Creek GRA has a low favorability (2A) for potential oil and gas resources. Miocene Lake Bruneau sediments are the only potentially favorable lithostratigraphic units in the study area⁽¹⁰⁾.

Bentonite is a common alteration product in volcanic terraines. The entire GRA is assigned a low favorability (Class 2) for this commodity because the requisite favorable geologic environment is inferred, but not known, to be present⁽¹²⁾. There are no known occurrences or other direct or indirect data to substantiate this classification. Therefore, the lowest confidence level (A) is assigned.

The Big Jacks Creek GRA is classified Least Favorable (Class 1) for uranium and thorium, tar sands and oil shale, limestone, and zeolite resources because the geologic environments and inferred geologic processes do not indicate favorability for the presence or accumulation of these commodities. All of the Least Favorable classifications have low confidence levels (A through C) because there is little or no evidence to support or refute the assessments (Table 4-1).

TERRADATA's classification of the Big Jacks Creek GRA for leasable commodities is in agreement with the USGS classification of leasable commodities in the same area^(23, 24, 25).



5. RECOMMENDATIONS FOR FUTURE WORK

Further surface geologic investigations, including detailed mapping and stratigraphic studies, could enhance the confidence levels of many of the classifications in the Big Jacks Creek GRA. It is doubtful, however, that the original classifications would change substantially. Sub-surface investigations are probably not warranted in this area due to the costly nature of the available methods. Geophysical and geochemical surveys might provide some insight into the potential resources in the study area.



- APPENDIX A -

References Cited

REFERENCES CITED

1. Fay, W.M., Cook, J.R.; 1982; Gold analysis by neutron activation from SRL NURE samples; Savannah River Laboratory; United States Department of Energy, Open-File Report PGJ/F-045(82), 34p., 11 plates, 1 fiche.
2. Berry, M.R., Castor, S.B., and Robins, J.W.; 1982, National uranium resource evaluation, Jordan Valley quadrangle, Oregon and Idaho; United States Department of Energy, Open-File Report PGJ/F-132(82), 33p.
3. Oak Ridge Gaseous Diffusion Plant; 1982; Hydrogeochemical and stream sediment reconnaissance basic data for Jordan Valley quadrangle, Oregon and Idaho; United States Department of Energy, Open-File Report GJBX-58(82), 97p., 1 fiche.
4. Geodata International, Inc.; 1980; Aerial radiometric and magnetic survey, Jordan Valley national topographic map, Oregon and Idaho; United States Department of Energy, Open-File Report GJBX-95(80), 203p., 108 fiche.
5. Weissenborn, A.E. (Ed.); 1964; Mineral and water resources of Idaho; 88th Congress, 2nd Session, Committee on Interior and Insular Affairs, United States Senate, 335p.
6. McIntosh, W.L., and Eister, M.F.; 1976; Geologic map index of Nevada; United States Geological Survey.
7. Bennett, E.H.; 1976; Reconnaissance geology and geochemistry of the South Mountain - Juniper Mountain region, Owyhee County, Idaho; Idaho Bureau of Mines and Geology, Pamphlet No. 166, 68p., appendices.
8. Thornbury, W.D.; 1965; Regional geomorphology of the United States; John Wiley and Sons, Inc., New York, 609p.
9. Neill, W.M.; 1975; Geology of the southwestern Owyhee Mountains and environs, Owyhee County, Idaho; Stanford University, Palo Alto, California, M.S. Thesis, 59p.
10. Newton, V.C., Jr.; 1982; Geology, energy, and mineral resources appraisal, BLM Region I, Columbia Plateau, oil and gas; for TERRADATA, Lakewood, Colorado, unpublished report (this file as been placed in the appropriate GRA files), 20p., plates.
11. Armstrong, R.L.; 1975; The geochemistry of Idaho; Isochron/West, No. 14, 50p.
12. Schlicker, H.G.; 1982; Geology, energy, and mineral resources appraisal, BLM Region I, Columbia Plateau, industrial minerals and geologic hazards; for TERRADATA, Lakewood, Colorado, unpublished report (this file as been placed in the appropriate GRA files), 56p.
13. Firby, J.; 1982; Geology, energy, and mineral resources appraisal, BLM Region I, Columbia Plateau, paleontology; for TERRADATA, Lakewood, Colorado, unpublished report (this file as been placed in the appropriate GRA files), 124p.



14. Erken, E.B., McIntyre, D.H., and Bennett, E.H., Jr.; 1978; Preliminary geologic map of the west half of Owyhee County, Idaho; United States Geological Survey, Open-File Report 78-341, Scale 1:125,000, 14p.
15. Mason, R.S.; 1982; Geology, energy, and mineral resources appraisal, BLM Region I, Columbia Plateau, Coal; for TERRADATA, Lakewood, Colorado, unpublished report (this file as been placed in the appropriate GRA files), 5p.
16. Weis, P.L.; 1982; Geology, energy, and mineral resource appraisal, BLM Region I, Columbia Plateau, metals and non-metals; for TERRADATA, Lakewood, Colorado, unpublished report (this file as been placed in the appropriate GRA files), 24p.
17. Budding, A.; 1982; Geology, energy, and mineral resources appraisal, BLM Region I, Columbia Plateau, Oil Shale and Tar Sands; for TERRADATA, Lakewood, Colorado, unpublished report (this file as been placed in the appropriate GRA files), 12p.
18. Youngquist, W.; 1982; Geology, energy, and mineral resources appraisal, BLM Region I, geothermal resources; for TERRADATA, Lakewood, Colorado, unpublished report (this file as been placed in the appropriate GRA files), 65p.
19. Miller, R.; 1982; Geology, energy, and mineral resources appraisal, BLM Region I, Columbia Plateau, Uranium and Thorium; for TERRADATA, Lakewood, Colorado, unpublished report (this file as been placed in the appropriate GRA files), 15p.
20. Powers, H.A.; 1947; Diatomite deposits of southwestern Idaho; Idaho Bureau of Mines and Geology, Mineral Resources Report No. 4, 27p.
21. Meisinger, A.C.; 1981; Diatomite; in Bureau of Mines Mineral Yearbook, 1981, United States Department of the Interior, United States Bureau of Mines, 36p.
22. Meisinger, A.C.; 1982; Diatomite; in Mineral Commodity Summaries, 1982, United States Department of the Interior, United States Bureau of Mines, 183p.
23. Godwin, L.H., Oberlindacher, P., and Moore, S.; 1981; Lands valuable for geothermal resources map for the State of Idaho; United States Geological Survey, Minerals Management Service, Menlo Park, California, Revised, Scale 1:500,000.
24. Horn, G., and others; 1980; Lands valuable for oil and gas map for the State of Idaho; United States Geological Survey, Minerals Management Service, Menlo Park, California, Revised, Scale 1:500,000.
25. Hite, R.J., and Oberlindacher, P.; 1977; Lands favorable for sodium and potassium map for the State of Idaho; United States Geological Survey, Minerals Management Service, Menlo Park, California, Revised, Scale 1:500,000.



- APPENDIX B -

Explanation For Figure 3-1



FIGURE 3-1
(Explanation)

7

7 NAME- NEW OIL & GAS CO REFERENCE NUMBER- 0160730185
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1645M:500M
 LATITUDE- N 42 32 50 PRECISION- 10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 14 SECTION SUBDIVISION- SE
 RIVER EAST- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- EXP. PROSPECT OPERATION TYPE- WELL
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- NEW OIL & GAS CO
 COMMON CODE- PETROLEUM OIL SHALE
 MINING INDUSTRY OF IDAHO 1930 P192

8

7 NAME- BIG FOUR DEVELOPMENT CO REFERENCE NUMBER- 0160730183
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- 10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER EAST- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- BIG FOUR DEVELOPMENT CO
 COMMON CODE-
 MINING INDUSTRY OF IDAHO 1929 P187

9

7 NAME- CHIEF REFERENCE NUMBER- 0160730194
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- 10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER EAST- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- CHIEF
 COMMON CODE-
 MINING INDUSTRY OF IDAHO 1929 P189



FIGURE 3-1
(Explanation Continued)

10
 7 NAME- DELAMER PLACERS REFERENCE NUMBER- 0160730238
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- TRENCH
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7BA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- SURFACE
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- DELAMER PLACERS
 COMMOD MOB- GOLD
 MINING INDUSTRY OF IDAHO 1937 P207

11
 7 NAME- ECLIPSE MINING REFERENCE NUMBER- 0160730208
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7BA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- ECLIPSE MINING
 COMMOD MOB-
 MINING INDUSTRY OF IDAHO 1930 P192

12
 7 NAME- EDNY-CONWAY-EDDY MINING & MILLING REFERENCE NUMBER- 0160730228
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7BA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- EDNY-CONWAY-EDDY MINING & MILLING
 COMMOD MOB- SILVER GOLD
 MINING INDUSTRY OF IDAHO 1933 P169



FIGURE 3-1
(Explanation Continued)

13
 7 NAME- GOLD STAR REFERENCE NUMBER- 0160730222
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- GRL BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7BA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- GOLD STAR
 COMMON MOD-
 MINING INDUSTRY OF IDAHO 1930 P193

14
 7 NAME- GOLDEN CREST MINING & MILLING CORP REFERENCE NUMBER- 0160730260
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- TOWN
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7BA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- GOLDEN CREST MINING & MILLING CORP
 COMMON MOD- GOLD SILVER
 MINING INDUSTRY OF IDAHO 1963-64 P125

15
 7 NAME- GOLDFLOUR MINING CO REFERENCE NUMBER- 0160730241
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- TRENCH
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7BA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- SURFACE
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- GOLDFLOUR MINING CO
 COMMON MOD- GOLD
 MINING INDUSTRY OF IDAHO 1939 P242



FIGURE 3-1
(Explanation Continued)

16

7 NAME- HAPPY BOY REFERENCE NUMBER- 0160730202
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- HAPPY BOY
 COMMOD/MOD-
 MINING INDUSTRY OF IDAHO 1929 P189

17

7 NAME- HATHAWAY CO REFERENCE NUMBER- 0160730262
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- HATHAWAY CO
 COMMOD/MOD- GOLD
 MINING INDUSTRY OF IDAHO 1965 P68

18

7 NAME- IDAHO CALCIUM CORP REFERENCE NUMBER- 0160730247
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- TRENCH
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- SURFACE
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- IDAHO CALCIUM CORP
 COMMOD/MOD- STONE LIMESTONE CB
 MINING INDUSTRY OF IDAHO 1950 P192



FIGURE 3-1
(Explanation Continued)

19

7 NAME- IDAHO GOLD & PLATINUM MERGER MINES REFERENCE NUMBER- 0160730187
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42° 32' 50" PRECISION- >10KM
 LONGITUDE- W 116° 06' 00" REFERENCE POINT- DRAIN TRENCH
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7RA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- IDAHO GOLD & PLATINUM MERGER MINES
 COMMOD CODE- PLATINUM
 MINING INDUSTRY OF IDAHO 1923 P188

20

7 NAME- IDAHO PERLITE INC REFERENCE NUMBER- 0160730254
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42° 32' 50" PRECISION- >10KM
 LONGITUDE- W 116° 06' 00" REFERENCE POINT- TRENCH
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7RA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- SURFACE
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- IDAHO PERLITE INC
 COMMOD CODE- PERLITE
 MINING INDUSTRY OF IDAHO 1957 P114

21

7 NAME- MAC D MINING CO REFERENCE NUMBER- 0160730257
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42° 32' 50" PRECISION- >10KM
 LONGITUDE- W 116° 06' 00" REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 7RA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- WFOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- MAC D MINING CO
 COMMOD CODE- MERCURY
 MINING INDUSTRY OF IDAHO 1961 P103



FIGURE 3-1
(Explanation Continued)

22

7 NAME- MINERAL HILL URANIUM EXPLORATION CO REFERENCE NUMBER- 0160730255
 STATE- IDAHO COUNTY- DOWHIE ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- MINERAL LOC
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- MINERAL HILL URANIUM EXPLORATION CO.
 COMMOD/MOD- URANIUM U308 CONTENT
 MINING INDUSTRY OF IDAHO 1957 P114

23

7 NAME- MINERALS INC REFERENCE NUMBER- 0160730253
 STATE- IDAHO COUNTY- DOWHIE ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- TRENCH
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- SURFACE
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- MINERALS INC
 COMMOD/MOD- PHOSPHATE PHOSPHOROUS
 MINING INDUSTRY OF IDAHO 1955 P112

24

7 NAME- NEW ERA MINING & DEVELOPMENT CO REFERENCE NUMBER- 0160730227
 STATE- IDAHO COUNTY- DOWHIE ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- TRENCH
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- SURFACE
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- NEW ERA MINING & DEVELOPMENT CO
 COMMOD/MOD- GOLD
 MINING INDUSTRY OF IDAHO 1932 P184



FIGURE 3-1
(Explanation Continued)

25

7 NAME- CREAMA DEVELOPING CO REFERENCE NUMBER- 0160730248
 STATE- IDAHO COUNTY- DOWHIE ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PROSPECT OPERATION TYPE- WELL
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- CREAMA DEVELOPING CO
 COMMOD/MOD- PETROLEUM NATURAL GAS
 MINING INDUSTRY OF IDAHO 1950 P193

26

7 NAME- DAYHEE DEVELOPMENT CO REFERENCE NUMBER- 0160730224
 STATE- IDAHO COUNTY- DOWHIE ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- DAYHEE DEVELOPMENT CO
 COMMOD/MOD-
 MINING INDUSTRY OF IDAHO 1930 P194

27

7 NAME- REYNOLDS CREEK COAL CO REFERENCE NUMBER- 0160730229
 STATE- IDAHO COUNTY- DOWHIE ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- REYNOLDS CREEK COAL CO
 COMMOD/MOD- COAL
 MINING INDUSTRY OF IDAHO 1933 P171



FIGURE 3-1
(Explanation Continued)

28
7 NAME- SIDNEY MINING CO REFERENCE NUMBER- 0160730264
STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
LATITUDE- N 42 32 50 PRECISION- >10KM
LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
UTM: ZONE 11N NORTHLING 4710714 EASTING 573897
PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
RIVER BASIN- 7RA BRUNEAU RIVER DOMAIN- UNKNOWN
STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- JORDAN VALLEY TYPE- 1:250K
1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
PRIMARY NAME- SIDNEY MINING CO
COMMOD MOD- SILVER
MINING INDUSTRY OF IDAHO 1965 PGB

29
7 NAME- SNAKE RIVER EXPLORATION CO REFERENCE NUMBER- 0160730239
STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
LATITUDE- N 42 32 50 PRECISION- >10KM
LONGITUDE- W 116 06 00 REFERENCE POINT- TRENCH
UTM: ZONE 11N NORTHLING 4710714 EASTING 573897
PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
RIVER BASIN- 7RA BRUNEAU RIVER DOMAIN- UNKNOWN
STATUS- DLVEL DEPOSIT OPERATION TYPE- SURFACE
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- JORDAN VALLEY TYPE- 1:250K
1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
PRIMARY NAME- SNAKE RIVER EXPLORATION CO
COMMOD MOD- GOLD
MINING INDUSTRY OF IDAHO 1937 P209

30
7 NAME- SOUTH MOUNTAIN MINING REFERENCE NUMBER- 0160730243
STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
LATITUDE- N 42 32 50 PRECISION- >10KM
LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
UTM: ZONE 11N NORTHLING 4710714 EASTING 573897
PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
RIVER BASIN- 7RA BRUNEAU RIVER DOMAIN- UNKNOWN
STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- JORDAN VALLEY TYPE- 1:250K
1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
PRIMARY NAME- SOUTH MOUNTAIN MINING
COMMOD MOD- LEAD
MINING INDUSTRY OF IDAHO 1940



FIGURE 3-1
(Explanation Continued)

31
 7 NAME- US TITANIUM CORP REFERENCE NUMBER- 0160730268
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- US TITANIUM CORP
 COMMON MOD- TITANIUM
 MINING INDUSTRY OF IDAHO 1968 P105

32
 7 NAME- VICTORY MINING & MILLING CO REFERENCE NUMBER- 0160730272
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- VICTORY MINING & MILLING CO
 COMMON MOD- GOLD
 MINING INDUSTRY OF IDAHO 1924 P145

33
 7 NAME- WESTERN MINING & EXPLORATION CO REFERENCE NUMBER- 0160730240
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >10KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- 78A BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 MAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- WESTERN MINING & EXPLORATION CO
 COMMON MOD- GOLD
 MINING INDUSTRY OF IDAHO 1937 P209



FIGURE 3-1
(Explanation Concluded)

34
 7 NAME- WHALECLOUD MINE REFERENCE NUMBER- 0160730252
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1646M:500M
 LATITUDE- N 42 32 50 PRECISION- >1KM
 LONGITUDE- W 116 06 00 REFERENCE POINT- ORE BODY
 UTM: ZONE 11N NORTHING 4710714 EASTING 573897
 PUBLIC LAND SURVEY TOWNSHIP- 010 S RANGE- 003 E
 DESCRIPTION SECTION- 16 SECTION SUBDIVISION- SE
 RIVER BASIN- YBA BRUNEAU RIVER DOMAIN- UNKNOWN
 STATUS- PAST PRODUCER OPERATION TYPE- UNDERGROUND
 MESA ID NO. YEAR FIELD CHECKED- MAP REPOSITORY- FOC
 VAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE-
 PRIMARY NAME- WHALECLOUD MINE
 COMMOD MOD- RARE EARTH GEMSTONE
 GYPSUM
 MINING INDUSTRY OF IDAHO 1954 P115
 ALSO "MINING FOSSILS"

61
 19 NAME- MAY DAY REFERENCE NUMBER- 0160730365
 STATE- IDAHO COUNTY- Owyhee ELEV:PREC- 1280M:500M
 LATITUDE- N 42 50 40 PRECISION- 1KM
 LONGITUDE- W 116 20 25 REFERENCE POINT- APPROX
 UTM: ZONE 11N NORTHING 4713536 EASTING 552910
 PUBLIC LAND SURVEY TOWNSHIP- 007 S RANGE- 001 E
 DESCRIPTION SECTION- 01 SECTION SUBDIVISION- C
 RIVER BASIN- YBT SNAKE RIVER DOMAIN- UNKNOWN
 STATUS- UNKNOWN OPERATION TYPE- SURFACE
 MESA ID NO. YEAR FIELD CHECKED- 1968 MAP REPOSITORY- FOC
 VAP NAME- JORDAN VALLEY TYPE- 1:250K
 1:250,000 MAP NAME- JORDAN VALLEY MINERAL PROPERTY FILE- 30.063
 PRIMARY NAME- MAY DAY
 COMMOD MOD- GOLD SILVER

